

## CLAIMS

- 1.- Tablets for the controlled emission of at least one gas, characterized in that they comprise one emulsion-dispersion made up of:
- an acid or an alkali (or both), free or in the form of a salt or chelate, in a solid or liquid state dispersed in
  - a water-in-oil or oil-in-water emulsion containing:
    - (a) at least one emulsifier
    - (b) at least one hydrophilic polymer
    - (c) an oil phase
    - (d) optionally, additives;
- said tablets being solid at a temperature lower than 50 °C.
- 2.- A process of production of a tablet for the controlled emission of at least one gas, characterized in that in a first step, an emulsion of an oil phase in a hydrophilic polymer is formed thanks to an appropriate emulsifier, under hot conditions and under agitation, and in a second step, an acid or an alkali or an alkali and acid mixture is alternatively added, which is mixed, under hot agitation, until a viscous liquid with an appropriate homogeneity level is obtained; the emulsion-dispersion thus formed is cooled, at the same time giving it the desired shape by means of molding; finally, the tablet is obtained in a state solid and stable against unintentional disintegration.
- 3.- Tablets for the controlled emission of at least one gas according to the preceding claim, characterized in that the solid state is basically achieved by temperature drop after hot forming the paste essentially constituting the tablet and not by pressure, a certain light pressure being necessary only for molding.
- 4.- A tablet consisting of an emulsion-dispersion for the controlled emission of gas according to any appropriate combination of the preceding claims, characterized in that the hydrophilic polymer has a molecular weight of 100-500000 amus, preferably of 1000-30000 amus, and more preferably between 1000-8000 amus.
- 5.- A tablet consisting of an emulsion-dispersion for the controlled emission of gas according to any appropriate combination of the preceding claims, characterized in that the oil phase comprises compounds chosen among the group of: natural or modified vegetable oils, hydrogenated vegetable oils, mineral oils, silicones, fluorinated silicones, modified silicones, or mixtures thereof in any proportion.
- 6.- A tablet consisting of an emulsion-dispersion for the controlled emission of gas according to any appropriate combination of the preceding claims, characterized in that the oil phase or the hydrophilic polymer or both contain additives:

- (a) that prevent the deterioration thereof, preferably antimicrobial agents, antioxidants, UV blockers or filters.
- (b) odorizing aromas that give off a characteristic smell, together with the evolution of gas, upon said tablets reacting with an acid or a base.
- 5 (c) sequesterers of acids or bases.
- (d) adsorbents/sequesterers of acids or bases of an organic (preferably EDTA, protein complexes) or inorganic (clays, sepiolites, zeolites) nature, including polymers (preferably based on citric or maleic acid remains integrated in the polymer, in the case of an alkaline tablet, preferably based on sulphonates, lignosulphonates, in the case of an acid tablet).
- 10 (e) salts that increase the ionic strength of the solution in which the tablet disintegrates.
- (f) agglomerants or antiagglomerants, dispersants, stabilizers.

7.- A tablet consisting of an (water-in-oil) emulsion-dispersion for the controlled emission of gas according to any appropriate combination of the preceding claims, characterized in that the emulsifier or mixture of emulsifiers has a hydrophilic-lipophilic balance (HLB) of 1-7.

8.- A tablet consisting of an (oil-in-water) emulsion-dispersion for the controlled emission of gas according to any appropriate combination of the preceding claims, characterized in that the emulsifier or mixture of emulsifiers has a hydrophilic-lipophilic balance (HLB) of 7-18.

9.- A tablet consisting of an emulsion-dispersion for the controlled emission of gas according to any appropriate combination of the preceding claims, characterized in that the hydrophilic phase is chosen among the group of polymers of the polyalkylene glycols, optionally derivatized.

25 10.- A tablet according to any appropriate combination of the preceding claims, characterized in that the generated gas is at least CO<sub>2</sub>.

11.- A tablet according to claim 10, characterized in that the gas comes from a carbonate or a hydrogen carbonate of an alkaline or alkaline-earth metal (or its mixtures) emulsified-dispersed inside said tablet, the CO<sub>2</sub> gas being released by reaction of any acid in the presence of the tablet.

12.- A tablet according to any appropriate combination of the preceding claims, characterized in that the acids are preferably chosen among the group: citric, lactic, phosphoric, benzoic, malic, maleic, malonic, fumaric, acetic, formic, propionic, succinic; as well as salts from these acids; these acids (or their mixtures) being emulsified-dispersed inside the tablet.

13.- A process of production of CO<sub>2</sub> according to the preceding claims, characterized in that the preferred acids mentioned in Claim 12 are in a solution that reacts with an alkaline tablet.

**14.-** A process of production of CO<sub>2</sub> according to any appropriate combination of the preceding claims, characterized in that the preferred bases mentioned in Claim 11 are in a solution that reacts with an acid tablet.

5     **15.-** A process of production of CO<sub>2</sub> according to any appropriate combination of the preceding claims, characterized in that both the acid(s) and the alkali(s) are emulsified-dispersed in the same tablet, the mixture and thus the gas releasing reaction occurring upon the disintegration of the tablet in a medium that allows the reaction between the  
10     acid(s) and the alkali(s).

10     **16.-** Tablets according to any appropriate combination of the preceding claims, characterized in that their use is in a drip-type medical device wherein there is an aqueous solution of an acid, preferably citric acid at 30-37% in water (w/w), separated by means of a sheet of plastic or plastic with aluminum from an alkaline tablet (preferably consisting of (a) partially hydrogenated vegetable oil (b) emulsified with a  
15     hydrophilic polymer, most preferably of a molecular mass between 2000-8000 amus, (c) an emulsifier of HLB 3-6, and (d) an alkali, preferably sodium carbonate); the sheet being broken by pressure right at the desired moment of using the drip; the CO<sub>2</sub> gas is then released by a controlled acid-base reaction upon the citric acid coming in contact with the bicarbonate and carbonate ions, and enters a chamber wherein the injectable liquid solution, which is encased in plastic, is found, preferably saline serum, serums with  
20     medicaments, blood or products derived from blood (encased in plastic), the CO<sub>2</sub> thereby creating pressure on the casing of the injectable solution which generates its flow towards the patient, this pressure being the primary regulator of the injection rate of the injectable solution.

25     **17.-** The use of tablets according to any appropriate combination of the preceding claims, characterized in that a controlled emission of pungent smell (by the release of a pungent gas such as sulfur or ammonia or mercaptan compounds -or their mixtures-, more preferably SH<sub>2</sub>) is obtained in an olfactory alarm device, wherein the factor causing the alarm state trip causes in turn that an acid or basic tablet contacts a basic or acid solution respectively.

30     **18.-** The use of tablets according to any appropriate combination of the preceding claims in agriculture for the disinfection of soils or cultivation sites in general by the release of disinfecting and/or fumigating gases traditionally used or present in the state of the art, preferably hydrogen cyanide.

35     **19.-** Tablets according to any appropriate combination of the preceding claims, characterized in that they contain an emetic product as an additive so that they are vomited in case of voluntary or involuntary ingestion thereof, greatly reducing their toxicity due to ingestion.

40     **20.-** Tablets according to any appropriate combination of the preceding claims, characterized in that their main use is as aromatic agents in the bath/shower (upon being dissolved in water) or in home aroma devices, by disintegration thereof in contact with water at the usual pH of the bath or home water; the

aromas preferably being chosen among the group of: thymol, borneol, anethole, limonene, pinene, and terpenes in general.

5     **21.-** Tablets for the controlled emission of O<sub>2</sub>, characterized in that they comprise a water-in-oil emulsion made up of:

- (a) at least one emulsifier
- (b) at least one hydrophilic polymer
- (d) hydrogen peroxide
- (d) an oil phase
- 10     (e) optionally, additives;

said tablets being molded in a solid state at a temperature lower than 40 °C and applicable in controlled breathing systems both at a microbial and an animal or plant level, as well as in systems or processes requiring a continuous O<sub>2</sub> supply in a controlled manner (preferably chemical reactions, aquariums, chambers for microorganism growing, etc.).

15     **22.-** A procedure for the controlled emission of O<sub>2</sub>, characterized in that the tablets formed according to Claim 21 come in contact with a solution containing enzymes of the peroxidase group, this solution produces O<sub>2</sub> upon the enzymes coming in contact with the hydrogen peroxide which is found in the tablet as a dispersed phase, together with the hydrophilic polymer, the oil being the continuous phase.

20     **23.-** Tablets according to any possible combination of the preceding claims, wherein a colorant or reaction indicator (either acid-base or enzymatic) is added in order to observe the appearance of color upon initiation of the reaction, optionally the intensity of the color varies as the reaction develops.

**Tablets with emulsified polymer matrix for the controlled emission of gases, and procedure for their production.**

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**Abstract**

10 Tablets capable of producing a gas in a controlled manner for its preferred use in apparatuses intended for the administration of medicaments or serums, such that the gas exerts the control of the rate of release of the serum or medicament to the patient. The tablets comprise an emulsified polymer matrix (oil phase and hydrophilic phase) that allows that the reaction between an acid and a base or an enzymatic reaction take place in a controlled manner, especially with a constant gas evolution rate during the useful life of use of the tablet, thanks the protection that the emulsified polymer matrix (containing oil) offers.

# **Certificate of Verification**

I, PABLO BLANC PATTISON

of

state that the attached document is a true and complete translation to the best of my knowledge of International Patent Application No. PCT/ES 2004/000561

Dated this Sunday, 16 day of July, 2006

Signature of translator:

A handwritten signature in black ink, appearing to read 'Pablo', written over a horizontal line.